## SOCIETIES AND ACADEMIES.

### LONDON.

**Geological Society,** June 7.—Dr. J. E. Marr, F.R.S., president, in the chair.—The microscopic structure of minerals forming serpentine, and their relation to its history: Prof. T. G. **Bonney** and Miss C. A. **Raisin.** The authors embody their investigations in the following conclusions:—(1) That both a tint and pleochroism are accidental rather than essential characteristics of antigorite. (2) Neither are low polarisation-tints characteristic, unless two mica-like minerals exist, otherwise indistinguishable. (3) That it is doubtful whether any hard and fast line can be drawn between antigorite and the more fibrous forms in ordinary serpentine rocks. (4) That the most typical antigorite appears when the rock has been considerably affected by pressure, but it becomes less so when the latter has been very great. (5) That so far from the nearly rectangular cleavage of augite originating the "gestrickte struktur," it is worse preserved than any other original one in the process of serpentinisation. Typical antigorite, however, apparently is rather more readily produced from augite than from the other ferromagnesian silicates, but is more directly a consequence of pressure than of chemical composition.—The tarns of the Canton Ticino: Prof. E. J. **Garwood.** The lakes dealt with comprise the larger Alpine tarns which occur in the Canton Ticino. Most of these drain into the Ticino basin; one or two, however, flow into the Reuss or the Rhine. These lakes owe their origin, when they are rock-basins, to the presence of lines of weakness, along which in many cases solution has taken place, while in some shallow tarns ice may have removed detached fragments; but in no case has a lake been found which can reasonably be assigned to ice-excavation independent of rock-structure.

**Mineralogical Society,** June 14.—Prof. H. A. Miers, F.R.S., president, in the chair.—The chemical composition of lengenbachite: A. **Hutchinson.** A quantitative analysis of the new mineral from the Binnenthal recently described by Mr. R. H. Solly leads to the formula $7PbS.2As_2S_3$, part of the lead being replaced by silver and copper, and part of the arsenic by antimony.—The chemical composition of hutchinsonite: G. T. **Prior.** Chemical examination of this new and extremely rare mineral from the Binnenthal described by Mr. R. H. Solly showed that it could be added to crookesite and lorandite as a third mineral containing the rare element thallium as an important constituent. Quantitative analysis, made on a small amount of material (about 70 mg.), showed the presence of about 20 per cent. of thallium, and suggested the formula $(Tl,Cu,Ag)_2S.As_2S_3 + PbS.As_2S_3$.—The identity of the amiantos of the ancients with chrysotile: Dr. J. W. **Evans.** The principal source of amiantos appears to have been Cyprus. Specimens brought by Prof. Wyndham Dunstan from the ancient workings on the slopes of Mount Troodos prove to be chrysotile, and not tremolite asbestos. A chemical analysis by Mr. G. S. Blake confirmed this result.—Gnomonic projection on two planes at right angles: Dr. J. W. **Evans.** By means of these projections and the rotation of one plane on an axis at right angles to the other, simple solutions of crystallographic problems are obtained.—The **President** exhibited supersaturated solutions of sodium nitrate showing the transition from the metastable condition, in which crystallisation is only possible in the presence of solid crystals, to the labile condition, in which the liquid can crystallise spontaneously.

**Physical Society,** June 16.—Prof. J. H. Poynting, F.R.S., president, in the chair.—On the ratio between the mean spherical and the mean horizontal candle-power of incandescent lamps: Prof. **Fleming.** This paper contains a theoretical deduction from first principles of experimental results given by Mr. G. B. Dyke in a paper read before the Physical Society on November 11, 1904, respecting the ratio of the M.S.C.P. of incandescent electric lamps to the M.H.C.P. taken when the lamp was rotating round a vertical axis. In the case of nine different types of electric glow-lamps, this ratio was found to be a number near 0·78. The author shows, by discussing the simple case of linear filament, that the ratio of the M.S.C.P. to the horizontal candle-power for this last case must be represented by the value $\pi/4 = 0{\cdot}785$, and hence that the constant ratio found experimentally by Mr. Dyke necessarily follows as a simple consequence of the fact that the light sent out in any direction from each unit of length of an incandescent filament varies as the cosine of the angle of inclination of the ray to the normal to the filament. In the paper it is shown also how a simple correcting factor may be obtained for reducing the actual horizontal candle-power of a linear filament of finite length to the candle-power in the same direction which would be found if the elements of the filament were concentrated on the axis of the photometer and all normal to it.—The electrical conductivity of flames: Dr. H. A. **Wilson.** The paper contains an account of a series of experiments on the conductivity of a coal-gas flame for electricity between platinum electrodes immersed in the flame. The variation of the current with the distance between the electrodes and the fall of potential along the flame are investigated by using a special burner producing a long narrow flame. The burner consists of a fused quartz tube with a series of small holes parallel to its diameter. The electrodes are two parallel discs of platinum, one fixed at one end of the flame, and the other capable of movement horizontally in the flame, so that it can be placed at any desired distance from the fixed electrode. The current through the flame was measured by a moving coil galvanometer, and the potential difference between the electrodes by an electrostatic voltmeter. The quartz-tube burner being a good insulator enables a current to be passed from one end of the flame to the other without fear of any of it going through the tube instead of through the flame. It thus enables the effect of putting salts into different parts of the flame to be easily studied.—Contact with dielectrics: Rollo **Appleyard.** Among the conclusions arrived at are the following:—(*a*) Except in the case of homogeneous dielectrics, it is misleading to deduce specific values referred to unit cube of the material from the results of tests on sheets. (*b*) With tin-foil electrodes, the apparent resistance of press-spahn diminishes as the load increases, and it attains a fairly constant value at a load of 400 grams per cm.$^2$. (*c*) If, with tin-foil electrodes, the load is gradually diminished after a load of 543 grams per cm.$^2$, the resistance gradually rises, but the rise is less rapid than the diminution in the former case (*b*). (*d*) When the full load with tin-foil electrodes is again restored the resistance falls to its minimum value. (*e*) For small loads, with tin-foil electrodes, the 2nd-minute deflection is in general greater than the 1st-minute deflection. As the load increases, a point is reached at which these deflections become approximately equal. For loads greater than about 360 grams per cm.$^2$, the 1st-minute deflection is in general greater than the 2nd-minute deflection. (*f*) Increase of voltage, with tin-foil electrodes, especially with small loads, behaves like increase of load, apparently increasing the contact area, and diminishing the observed dielectric resistance. Load, voltage, and the normal effect of "absorption" thus combine to determine the ratio of the 1st-minute deflection to the 2nd-minute deflection. (*g*) When mercury electrodes are used, the dielectric-resistance, as measured at different voltages, is sensibly the same, even for abrupt and great changes of voltage. (*h*) When mercury electrodes are used, the 2nd-minute deflection is in general never greater than the 1st-minute deflection. The inference is that when, with tin-foil electrodes, the converse is the case, it arises from imperfect contact, and not from the material itself. (*i*) When mercury electrodes are used, the dielectric-resistance, as measured with a voltage applied in a given direction, is sensibly the same as that measured with the voltage reversed, and this equality appears to become greater after a few reversals. (*j*) There is a critical load at which tin-foil electrodes yield fairly accurate results. With greater loads there is danger of crushing the material. With a less load the contact is faulty.—The pendulum accelerometer; an instrument for the direct measurement and recording of acceleration: F. **Lanchester.**—A new form of pyknometer: N. V. **Stanford.**

**Royal Meteorological Society**, June 21.—Mr. Richard Bentley, president, in the chair.—Normal electrical phenomena of the atmosphere: G. C. **Simpson.** In no branch of physics has the discovery of "ions," "electrons," and "radio-activity" produced a greater revolution than in that devoted to atmospheric electricity. In this paper the author endeavoured to state the chief line along which during the last few years investigations have been made and the conclusions arrived at, and also to point out some of the problems awaiting solution. The amount of radio-active emanation in the lower regions of the atmosphere is increased by all those meteorological conditions which tend to keep the air stagnant over the earth's surface. The meteorological conditions which either cause or often accompany stagnant air are calm, low temperature and high relative humidity, while, on the contrary, high winds, high temperature, and low humidity generally accompany the mixing of large masses of air. This all agrees with the observed facts that the atmospheric radio-activity increases with falling temperature, rising humidity, and increasing wind strength.—Two new meteorological instruments: G. P. **Ferguson.** The instruments described were:—(1) automatic polar star light recorder for recording the amount of cloudiness at night; and (2) the ombroscope, an instrument for determining the time and duration of rain. Both these instruments are in use at the Blue Hill Observatory, Mass., U.S.A.

PARIS.

**Academy of Sciences**, June 19.—M. Troost in the chair.—On the preparation and properties of nitryl fluoride: Henri **Moissan** and M. **Lebeau** (see p. 206).—On some alkyl thujones and the combinations of thujone with aromatic aldehydes: A. **Haller.** The thujone was converted into its sodium derivative by means of sodium amide in ethereal solution, and this acted upon by the alkyl iodide. The preparation and properties of methyl, ethyl, propyl, and allylthujone are described, the special object of the work being to study the influence of the introduction of the alkyl group on the rotatory power. Thujone was also condensed with benzaldehyde, anisaldehyde, and piperonal, the effect in these cases being an enormous increase in the rotatory power. Special experiments were made to see if in the course of the work the thujone had been converted into isothujone, but this was found not to be the case. An improvement in the method of preparation of isothujone from thujone is also described.—Observations on the Giacobini comet (1905 *a*) made with the large equatorial of the Observatory of Bordeaux: Ernest **Esclangon.** The observations were made on May 2 and 9.—On the influence of concentration on the magnetic properties of solutions of cobalt: P. **Vaillant.** If A be the coefficient of magnetisation of a solution containing N equivalents of water and $n$ of salt, then $A=K'N+Kn$, where K and K′ are the coefficients characteristic of the water and the salt. It was found that the value of K was nearly independent of the concentration and of the nature of the salt, the chloride, nitrate, and sulphate being studied. The slight variation of K observed would appear to be due to ionisation.—On a basic ferric sulphate: A. **Recoura.**—The chemical properties of the anhydrous chloride of neodymium: Camille **Matignon.** Hydrogen at 1000° C. has no action upon the dry chloride, no trace of a subchloride being detected. Oxygen slowly converts the fused chloride into the oxychloride, NdOCl, water giving rise to the same substance. Hydriodic acid slowly converts the chloride into the iodide, and the bromide is formed with hydrobromic acid by a similar reaction.—On a method for determining the specific heats of solutions. The molecular heat of good and bad electrolytes: P. Th. **Muller** and C. **Fuchs.** The liquid is heated by a glass spiral containing mercury through which a constant current is passed, water and the solution being alternately introduced into the calorimeter. The causes of the differences between the specific heats of solutions of electrolytes and non-electrolytes are discussed.—Researches on the mercury formates: Raoul **Varet.** A thermochemical paper.—On some new nitrodinaphthopyranic derivatives: A. **Robyn.**—On sparteine; the stereoisomerism of the two iodomethylates: Charles **Moureu** and Amand **Valeur.** These two iodomethylates cannot be distinguished by their behaviour on heating, as they both split up quantitatively into methyl iodide and sparteine, and hence the author regards the isomerism as of a stereochemical order.—The influence of electrolytes on the mutual precipitation of colloids of opposite electrical sign: Larguier **des Bancels.**—On a new form of tartrate of thallium, and on isomorphous mixtures of the tartrates of thallium and potassium: Jean **Herbette.** Although the tartrates of thallium and potassium belong to different crystalline systems, mixtures of these salts exhibit a true isomorphism; the properties of the mixed crystals of these two salts do not vary in proportion to the chemical composition. A case analogous to this has already been pointed out by Groth for a mixture of potassium chlorate and permanganate.—The action of liquid air on the life of the seed: Paul **Becquerel.** The resistance of seeds to low temperatures depends entirely upon the quantity of water and gas contained in their tissues. If this quantity of water and gas is sufficient, the cold disorganises the protoplasm and nucleus in such a manner that life is impossible, but if the protoplasm has by drying attained its maximum concentration, it completely escapes the action of the low temperature, and the seed preserves its germinating power.—An enemy of the Tonkin coffee plant, the Xylotrechus of the dry bamboo: Louis **Boutan.**—Researches on the ethnology of the Dravidians. The anthropological relations between the mountain tribes and the castes of the plain: Louis **Lapicque.**—On the presence of graptolith schists in the High Atlas of Morocco: Louis **Gentil.**—On the formation of the Rochefort Cave (Belgium): E. A. **Martel.**—On the evolution of the fossil mammals: Marcellin **Boule.** A reply to a criticism of M. Depéret.—The meteorology of total eclipses of the sun: W. **de Fonvielle** and Paul **Bordé.** Remarks on the work done by Sir John Elliot on the lowering of the temperature during the eclipse of the sun.

## CONTENTS.


| | PAGE |
|---|---|
| The Face of the Earth. By J. W. G. | 193 |
| The "N" Rays. By Prof. John G. McKendrick, F.R.S. | 195 |
| The Science of Education. By A. T. S. | 195 |
| British Birds. By W. P. P. | 196 |
| **Our Book Shelf:—** | |
| Anderson and Collier: "Riding and Driving."—R. L. | 197 |
| Groll: "Der Oeschinensee im Berner Oberland" | 197 |
| Sargent: "Manual of the Trees of North America (exclusive of Mexico)" | 197 |
| **Letters to the Editor:—** | |
| Number of Strokes of the Brush in a Picture.—F. G. | 198 |
| The Hydrometer as a Seismometer.—G. T. Bennett | 198 |
| The Pressure of Radiation on a Clear Glass Vane.—Prof. Gordon F. Hull | 198 |
| The Habits of Testacella.—M. D. Hill | 199 |
| Nature and Man. By Prof. John Perry, F.R.S. | 199 |
| A Life's Work in the Theory of Evolution. (*Illustrated.*) By F. A. D. | 200 |
| Dr. William Thomas Blanford, F.R.S. By A. G. | 202 |
| Notes | 203 |
| **Our Astronomical Column:—** | |
| Astronomical Occurrences in July | 207 |
| New Observatory in Algeria. (*Illustrated.*) | 207 |
| A Suspected Sudden Change on Jupiter | 207 |
| Brightness of Jupiter's Satellites | 207 |
| Elliptical Elements for the Orbit of Comet 1905 *a* | 207 |
| Recent Positions of Eros | 207 |
| Telescopic Work for Observers of Planets. By W. F. Denning | 208 |
| The Royal Society Conversazione | 208 |
| Submarine Navigation. By Sir William H. White, K.C.B., F.R.S. | 209 |
| The Institution of Mechanical Engineers | 212 |
| University and Educational Intelligence | 214 |
| Societies and Academies | 215 |